

1. A process for making Nitinol rolling bearing elements of a desired shape, comprising:

making a ceramic mold having a cavity with an internal shape like said desired shape of said rolling bearing elements;

pouring molten Nitinol into said cavity;

cooling said mold and said Nitinol in said cavity to produce a solidified Nitinol form; and

disintegrating said mold to remove said Nitinol form .

2. A process as defined in claim 1, further comprising:

after removal of said Nitinol form from said mold, subjecting said Nitinol form to hot isostatic pressing at about 1650°F and 20,000 psi for about 2 hours.

3. A process as defined in claim 1, wherein said rolling bearing element is a

cylindrical roller bearing roller and said Nitinol form is a rod, and further comprising:

centerless grinding said rod to the desired maximum diameter of said roller elements; and;

cutting said rod to individual rollers about the length of said roller bearing elements.

4. A process as defined in claim 3, further comprising:

centerless grinding said individual rollers to the desired diameter and profile of said roller elements.

5. A process for making Nitinol ball bearing elements, comprising:

making a ceramic mold having elongated branches with spherical ball cavities therein;

pouring molten Type 60 Nitinol into said mold and allowing said molten Nitinol to flow into and fill said spherical ball cavities,

cooling said mold and said Nitinol in said mold to produce a solidified branch of connected Nitinol balls;

breaking said mold away from said Nitinol balls; and

separating said balls from said branch.

6. A process for making Nitinol ball bearing elements as defined in claim 5, further comprising:

after removal of said Nitinol branch of connected balls from said mold, subjecting said Nitinol branch of connected balls to hot isostatic pressing at about 1650°F and 20,000 psi for about 2 hours.

7. A process for making Nitinol ball bearing elements as defined in claim 5, further comprising:

grinding said balls to smooth spheres of the desired diameter.

8. A process as defined in claim 5, further comprising:

heating said balls to about 950°C and liquid quenching to harden said balls to about 62RC and produce a hard integral ceramic surface on said balls.

9. A Nitinol ball bearing element, comprising:
a sphere of Type 60 Nitinol.

10. A Nitinol roller bearing element, comprising:
a rod of Type 60 Nitinol.

11. A process as defined in claim 2, further comprising:
heating said Nitinol form to an elevated temperature in a range of about 800°C-950°C and rotary forging said Nitinol bar at said elevated temperature to produce a hot-worked rod having a diameter slightly greater than the desired diameter of said roller bearing elements.

12. A process for making balls out of a material such as Nitinol that is difficult or impossible to form into a ball, comprising:

selecting a sheet or plate of said material;
cutting ball blanks out of said sheet or plate; and
grinding said ball blanks in a ball grinder to a desired spherical shape and size.

13. A process as defined in claims 12, wherein:
said ball blanks are cubical in shape.

14. A process as defined in claim 12, wherein:

said ball blanks are cylindrical in shape.

15. A process as defined in claim 12, wherein:

said ball blanks are cut out of said sheet or plate by an industrial cutting laser.

16. A process as defined in claim 12, wherein:

said ball blanks have a center and six equal orthogonal dimensions through said center.

17. A process as defined in claim 16, further comprising:

tumbling said ball blanks in and abrasive tumbler to round off corners and edges of said ball blanks prior to grinding said ball blanks in said ball grinder.

18. A process for making Nitinol bearing races, comprising:

selecting a tube made of Type 60 Nitinol and having a central axis;

cutting bearing race blanks off said tube on a cutting plane perpendicular to said central axis;

grinding or machining said race blanks to desired outside dimensions and interior configuration.

19. A process as defined in claim 18, further comprising:

heat treating said race blanks to about 900°C and quenching to produce hardness of above about 58RC.

20. A bearing race, comprising:

an annular ring of Type 60 Nitinol.